

# Two New Species of *Paspalum* (Poaceae: Paniceae) from Venezuela and Colombia

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**ABSTRACT.** Morphological characters support the description of two new species of *Paspalum*: *P. atabapense*, from Depto. Atabapo, Venezuela, in group Alterniflora; and *P. tillettii*, from Comisaría del Guainía, Colombia, and Territorio Federal Amazonas, Venezuela, in an unspecified taxonomic group but clearly related to *P. schultesii* Swallen.

Preparatory to completing an account of the genus *Paspalum* for the *Flora of the Venezuelan Guayana*, two new species are described and illustrated.

*Paspalum* L., with more than 350 species, is one of the largest genera of grasses. It is confined primarily to the New World, although a few species occur in Africa, Asia, and Oceania. Several species are pantropical or nearly so, and two weedy species have now become widely naturalized as weeds in the tropics. A few have been widely distributed as forage grasses and have subsequently become naturalized in new areas. The most useful taxonomic treatment of this genus remains the monograph of the North American species (including Mesoamerica) by Chase (1929).

***Paspalum atabapense*** Davidse & Zuloaga, sp. nov. TYPE: Venezuela. Amazonas: Depto. Atabapo, SE bank of the middle part of Caño Yagua at Cucurital de Yagua, 3°36'N, 66°34'W, 120 m, 8 May 1979, G. Davidse, O. Huber & S. S. Tillett 17414 (holotype, MO; isotypes, IAN, SI, US, VEN). Figure 1.

Gramen perenne caespitosum; culmi 45–75 cm alti. Folia basalia; ligulae 0.5–1.2 mm longae, glabrae; laminae 6–18.5 cm × 0.3–0.4 mm, filiformes. Racemus 1, 3–9.5 cm longus; rhachis 0.4–0.5 mm lata, exalata vel interdum anguste alata basin versus. Spiculae 2.6–3.6 × 1.0–1.3 mm, ellipticae anguste, singulares, pubescentes; gluma inferna absens; gluma supera 0.3–0.7 mm spicula brevior. Flosculus superus 2.6–3.5 × 1.0–1.3 mm, stramineus. Antherae 1.5–1.9 mm longae.

Caespitose, perennial herbs. Culms 45–75 cm long, erect, unbranched above the base, with 2–3

nodes above the base; internodes cylindric, glabrous; nodes dark, glabrous or pilose. Leaves basal. Sheaths striate, rounded, densely pilose toward the base with appressed, whitish hairs, to sparsely pilose toward the apex, the margins glabrous. Ligules 0.5–1.2 mm long, membranous, glabrous, erose. Blades 6–18.5 cm long, 0.3–0.4 mm wide, filiform, involute, the adaxial surface scabrous, prominently ridged, the abaxial surface glabrous, the apex permanently involute, somewhat pungent. Inflorescences terminal, long-exserted; peduncle 4–17 cm long, cylindric, glabrous; raceme 1, 3.0–9.5 cm long, slightly arching, densely pilose at its base; rachis 0.4–0.5 mm wide, puberulent to glabrous, concavo-convex, unwinged or sometimes with partially developed wings 0.1–0.2 mm wide near a portion of the base, terminating in a spikelet; pedicels 0.1–0.3 mm long, densely short-pilose. Spikelets 2.6–3.6 mm long, 1.0–1.3 mm wide, solitary, plano-convex, narrowly elliptic, pilose. Lower glume always absent. Upper glume 2.4–3.0 mm long, 0.3–0.7 mm shorter than the upper floret, acute, 3-nerved. Lower floret sterile. Lower lemma as long as the spikelet, 3-nerved, glabrous to puberulent in the middle portion, pilose toward the margins. Lower palea usually absent, rarely developed and then to ½ as long as the lower lemma. Upper floret 2.6–3.5 mm long, 1.0–1.3 mm wide, as long as the spikelet, bisexual, narrowly elliptic, stramineous, chartaceous, smooth, papillose, the papillae regularly distributed; lemma 3-nerved, short-pilose, with prickle hairs at the apex. Stamens 3; anthers 1.5–1.9 mm long, purple. Styles 2, separate; stigmas about as long as the styles, plumose. Caryopsis (1.2–)1.4–1.5 mm long, 0.9–1.0 mm wide, obovate in outline; hilum punctiform; embryo ca. ⅔ as long as the caryopsis.

**Paratypes.** VENEZUELA. AMAZONAS: Depto. Atabapo, area between the W base of Cerro Yapacana and the headwaters of Caño Cotúa, 3°38'N, 66°52'W, 6 May 1979, Davidse, Huber & Tillett 17251 (K, MO, SI, US, VEN); Depto. Atabapo, sabanas y bosques ribereños en los alrededores de Canaripó, en la margen izquierda (Sur) del bajo Río Ventuari, a unos 20 km al E de la confluencia



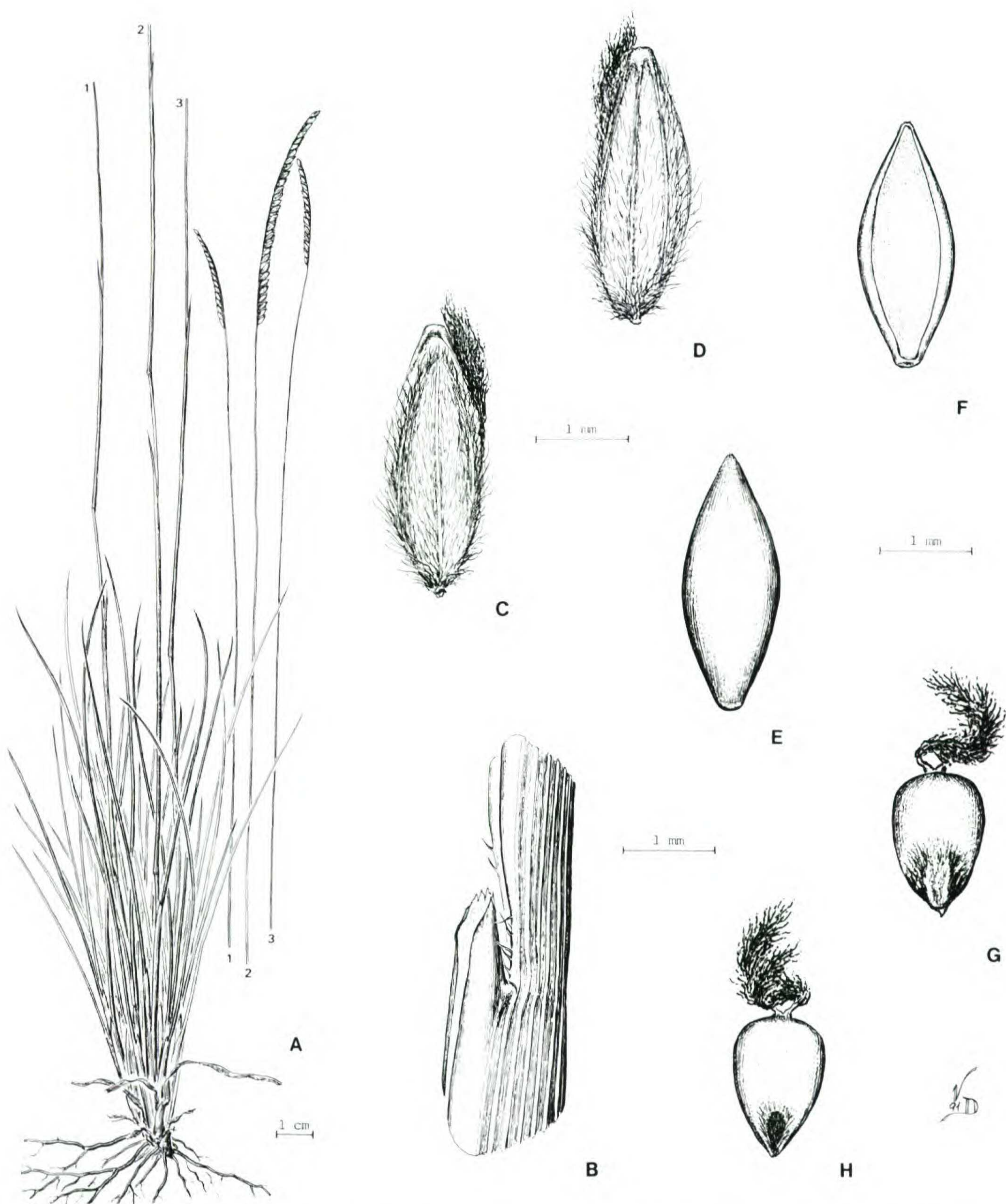


Figure 1. *Panicum atabapense* Davidse & Zuloaga (Davidse et al. 17414, MO). —A. Habit. —B. Leaf, ligular region. —C. Spikelet, upper glume view. —D. Spikelet, lower lemma view. —E. Upper floret, lemma view. —F. Upper floret, palea view. —G. Caryopsis, embryo side. —H. Caryopsis, hilum side.

con el Río Orinoco, 4°03'N, 66°49'W, 98 m, 30 May 1978, *Huber 1906* (MO, NY, VEN); Depto. Atabapo, tercera sabana al pie W del Cerro Yapacana, 3°38'N, 66°52'W, 100 m, 3 June 1978, *Huber 2023* (MO, NY, VEN).

This species is known so far only from a ca. 70 × 40-km area in the Depto. Atabapo, Territorio Federal Amazonas, Venezuela, where it grows in open,

white-sand savannas, at approximately 100 m elevation.

*Paspalum atabapense* appears to fit best in the informal West Indian group *Alterniflora* of Chase (1929) because it is perennial, caespitose, and has filiform basal leaves and solitary inflorescences with solitary spikelets. Although this group appears to be a heterogenous assemblage, *P. atabapense* is almost



certainly closely related to the Cuban endemic *P. rottboellioides* C. Wright. *Paspalum rottboellioides* differs from *P. atabapense* in its winged rachis up to 1.5 mm wide (vs. essentially wingless rachis 0.4–0.5 mm wide), spikelets with the upper glume as long as the upper floret and covering it (vs. 0.3–0.7 mm shorter than the upper floret and exposing its apex), lower lemma pilose at the base (vs. glabrous to puberulent in the middle and pilose along the margins), and blades densely papillose-pilose (vs. scabrous adaxially and glabrous abaxially).

The specific epithet refers to the Depto. Atabapo, where all four known collections originated.

***Paspalum tillettii* Davidse & Zuloaga, sp. nov.**

TYPE: Venezuela. Amazonas: Depto. Atabapo, Cucurital de Caname, S bank of the middle part of Caño Caname, 3°40'N, 67°22'W, 100 m, 30 Apr.–1 May 1979, G. Davidse, O. Huber & S. S. Tillett 16920 (holotype, MO; isotypes, SI, US, VEN). Figure 2.

Gramen perenne caespitosum; culmi 23–62 cm alti. Folia basalia; ligulae 0.2–0.5 mm longae, ciliolatae; laminae 4–17 cm × 0.3–0.6 mm (1.0–1.5 mm latae ubi complanatae). Racemi 2, 1.5–6 cm longi, conjugati; rhachis 0.2–0.5 mm lata, exalata alis. Spiculae 1.4–1.8(–2.2) × 0.7–0.8(–1.0) mm, ellipticae, singulares, pubescentes; gluma inferna absens vel raro ½–⅔-plo spicula longior; gluma supera plerumque 0.3–0 mm spicula brevior, raro ad 0.3 mm spicula longior. Flosculus superus 1.4–1.8(–2.0) × 0.7–0.8(–1.0) mm, ellipticus, atrobrunneus nitidus. Antherae 0.8–1.0 mm longae.

Tufted, caespitose, perennial herbs. Culms 23–62 cm tall, erect, unbranched above the base; internodes glabrous or sparsely pilose; nodes dark, sparsely pilose at the basal nodes, sparsely glabrous or pilose on the flowering culms. Leaves mostly basal, erect. Sheaths striate, rounded, the margins membranous, the basal ones strongly pilose toward the base, the upper ones usually glabrous to sparsely pilose, sometimes the entire sheath prominently pilose. Ligules 0.2–0.5 mm long, membranous, ciliate, often with hairs to 2.3 mm long in the back at the base of the blade. Blades 4–17 cm long, 0.3–0.6 mm wide, filiform, usually involute, sometimes flattened in the middle and then 1.0–1.5 mm wide, usually glabrous except for a dense row of whitish hairs to 3.2 mm long behind the ligule and at the sheath apex and sometimes with the lowest portion of the margins ciliate, or sometimes the lower half or the entire abaxial surface pilose, the adaxial surface prominently ridged; upper blades reduced. Inflorescences terminal, exserted; peduncle 8–22 cm long, cylindric, glabrous; racemes 2, 1.5–6 cm long, conjugate, usually with a dense tuft of white hairs

2–4 mm long at the base; rachis 0.2–0.5 mm wide, flexuous, glabrous, triquetrous, without wings, terminating in a spikelet; pedicels 0.2–0.5 mm long, glabrous to sparsely pilose. Spikelets 1.4–1.8(–2.2) mm long, 0.7–0.8(–1.0) mm wide, solitary, planoconvex, elliptic, dark, densely to sparsely pilose. Lower glume usually absent, rarely present (Davidse et al. 16920), lanceolate, ½–⅔ as long as the spikelet, pilose. Upper glume usually as long as or to 0.3 mm shorter than the upper floret, rarely to 0.3 mm longer, obtuse, covered with capitellate hairs toward the margins, nearly glabrous in the center to uniformly pilose, 3-nerved with obscure nerves. Lower floret sterile. Lower lemma 2–3-nerved, the nerves obscure, short-pilose toward the upper margin, otherwise glabrous or sparsely pilose. Lower palea absent. Upper floret 1.4–1.8(–2.0) mm long, 0.7–0.8(–1.0) mm wide, bisexual, elliptic, dark brown, smooth and shining, indurate, minutely papillose with microhairs at the lower margins of the lemma, otherwise glabrous. Stamens 3; anthers 0.8–1.0 mm long. Styles 2, separate; stigmas about as long as the styles, plumose, purple. Caryopsis 0.8–1.0 mm long, 0.6–0.8 mm wide, obovate in outline; hilum punctiform; embryo ca. ⅔ as long as the caryopsis.

*Paratypes.* VENEZUELA. AMAZONAS: Depto. Atabapo, Caño Caname (afluente derecho del medio Río Atabapo), sabanas de Cucurital, aprox. 20 km al E de la boca, 3°40'N, 67°22'W, 100 m, Huber, Tillett & Davidse 3702 (MO, VEN); Depto. Río Negro, extensa sabana en la margen derecha del bajo Río Pasimoni, 1°35'N, 66°33'W, 125 m, 8 Feb. 1981, Huber & Medina 5845 (MO, VEN); pequeña sabana ubicada en la margen derecha (E) del bajo Río Pasimoni, a unos 3 km al E del Río, 1°38'N, 66°32'W, 125 m, 9 Feb. 1981, Huber & Medina 5889 (VEN); Depto. Atabapo, white-sand savanna on the N bank of the lower part of Caño Caname, ca. 3 km W of Macaval, 3°41'N, 67°23'W, 95 m, 2 May 1979, Davidse, Huber & Tillett 17078 (K, MO, PRE, VEN); Depto. Atabapo, white-sand savannas on the N bank of Caño Caname, nearly opposite Cucurital de Caname, 3°40'N, 67°22'W, 95 m, 2 May 1979, Davidse, Huber & Tillett 17050 (MO, VEN); Depto. Atabapo, area between the W base of Cerro Yapacana and the headwaters of Caño Cotúa, 100 m, 3°38'N, 66°52'W, 100 m, 6 May 1979, Davidse, Huber & Tillett 17216 (INA, MEXU, MO, US, VEN). COLOMBIA. GUAINIA: near Coitara, ca. 7 km S of San Fernando de Atabapo, white-sand area adjoining a laja on the W bank of the Río Atabapo, 3°55'N, 67°43'W, 95 m, 28 Apr. 1979, Davidse 16824 (MO).

This species is known from the Comisaría del Guainía, Colombia, and the Territorio Federal Amazonas, Venezuela, where it grows in open white-sand savannas at an elevation of 95–220 m.

*Paspalum tillettii* is very closely related to *P. schultesii* Swallen, which is only known from the nearby Comisaría del Vaupés, Colombia. Both spe-



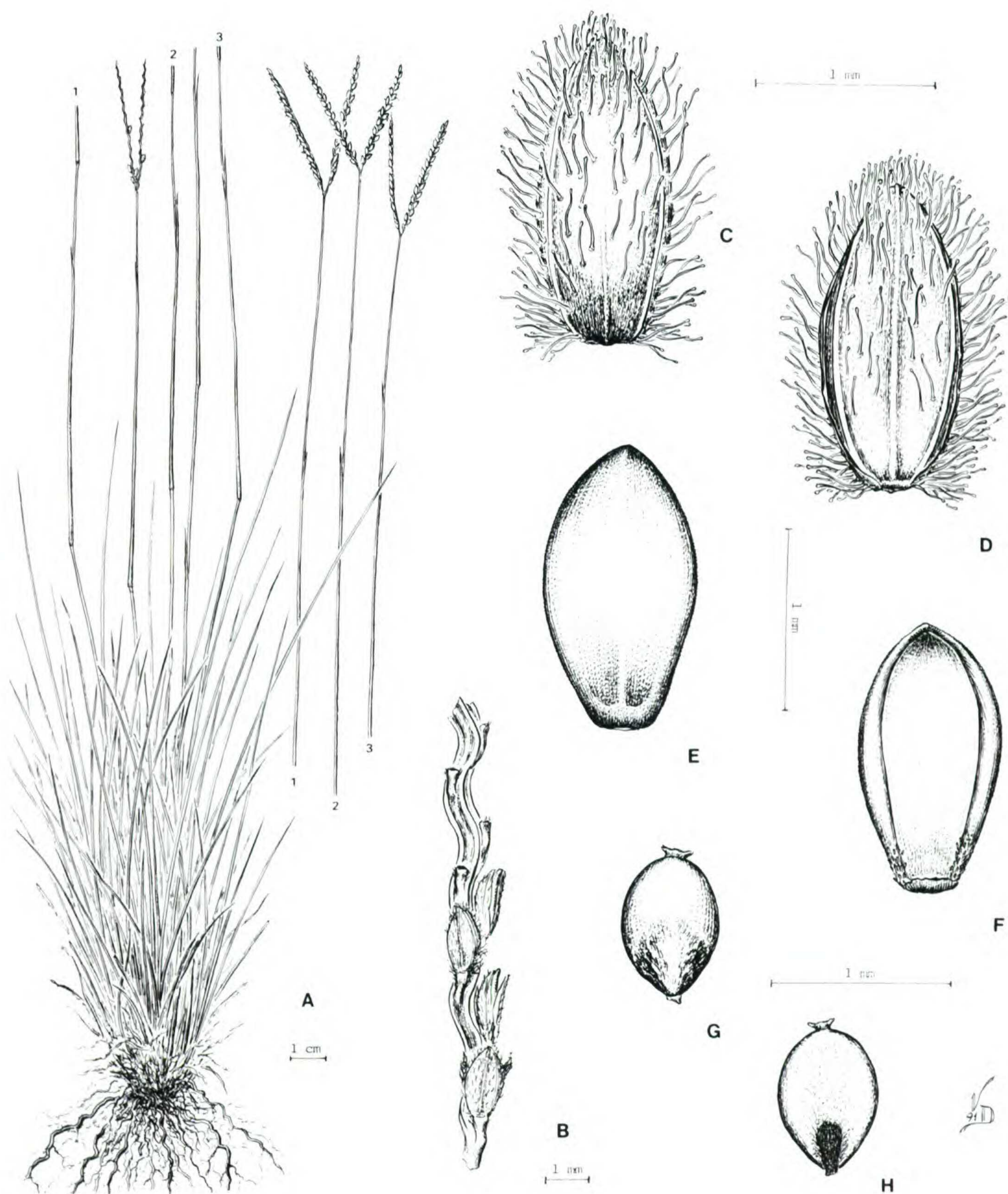


Figure 2. *Paspalum tillettii* Davidse & Zuloaga (Davidse et al. 16920, MO). —A. Habit. —B. Portion of a raceme with spikelets and pedicels. —C. Spikelet, upper glume view. —D. Spikelet, lower lemma view. —E. Upper floret, lemma view. —F. Upper floret, palea view. —G. Caryopsis, embryo side. —H. Caryopsis, hilum side.

cies have filiform, involute leaf blades, conjugate racemes, and a dark brown, shiny upper floret. This combination of characters is not known in any of the informal groups recognized by Chase (1929), and this combination also caused Swallen (1967) to exclude *P. schultesii* from any known group when describing this species. The dark brown, shiny upper floret is characteristic of all species of the Plicatula

group, but conjugate racemes are not known in that group. Conjugate racemes (*P. multicaule* Poir., *P. clavuliferum* C. Wright) and capitate hairs (*P. parviflora* Rhodé, *P. multicaule*, *P. clavuliferum*) occur in the Parviflora group, but none of the species in this group have a shiny, dark brown upper floret.

*Paspalum schultesii* differs from *P. tillettii* in having leaves about as long as (vs.  $\frac{1}{4}$ – $\frac{1}{2}$  as long as)



the flowering culms, basal sheaths with rufous (vs. white) hairs, spikelets lanceolate (vs. elliptic),  $2.4-3 \times 1.1-1.2$  mm (vs.  $1.4-1.8(-2.2) \times 0.7-0.8(-1.0)$  mm), and an acute upper glume 0.2–0.5 mm longer than the upper floret (vs. an obtuse upper glume as long as or 0.1–0.3 mm shorter). Although most spikelets are glabrous in *P. schultesii*, a few of the spikelets of the type collection have capitellate hairs. In both species these hairs are only inconspicuously enlarged at their tips in comparison to those of the Parviflora group. Nevertheless, all these capitellate hairs may be fundamentally of the same kind, and because such specialized hairs are relatively uncommon in the genus, they may prove to be good indicators of relationships. *Paspalum tillettii*, as here circumscribed, is variable in leaf pubescence and spikelet shape and pubescence.

The two collections (Huber & Medina 5845, 5889) from Depto. Río Negro have leaves that are conspicuously pilose nearly throughout, in contrast to the more nearly glabrous leaves of the northern collection from Colombia and Depto. Atabapo.

Certain collections (i.e., Davidse et al. 17216, 17078) appear to consist of two kinds of plants, one with spikelets 1.5–1.8 mm long and another with spikelets 1.8–2.2 mm long but about as wide as the first. The latter kind has obtuse upper glumes as long as or to 0.2–0.3 mm longer than the upper floret, and it varies in the direction of *P. schultesii*. This pattern of variation suggests the possibility of hybridization. It would be worthwhile in future work to look for additional intermediate populations to determine whether such plants represent hybrid swarms between two hybridizing species. The white-sand savannas in the eastern Colombian llanos are interspersed with other kinds of soils, and this creates a mosaic of vegetation types, certainly a setting that might be favorable for the maintenance of hybrid swarms.

Another collection (Venezuela. Amazonas: Depto. Atures, transecto desde matorral ribereño hasta bosque bajo ralo, en la margen izquierda del Caño “Cabeza de Manteco,” afluente del Río Autana, en el “Raudal Manteco,”  $4^{\circ}52'N$ ,  $67^{\circ}27'W$ , 100–120 m, 10 Nov. 1984, Guánchez & Melgueiro 3423 (MO)) is related to this species pair but is at the moment excluded from both *P. schultesii* and *P. tillettii*. In its overall leaf, inflorescence, and spikelet morphology it resembles both species. Its leaves are as long as the flowering culms and the hairs on the basal sheaths are rufous; and its spikelets are  $1.8-2.3 \times 1-1.1$  mm. In the first two characters it resembles *P. schultesii*, and in the latter, *P. tillettii*. However, it differs from both in its unusually broad pedicels.

This species is dedicated to a valued field companion, Stephen S. Tillett, Universidad Central de Venezuela, Caracas, Venezuela, in recognition of his outstanding contributions to Venezuelan botany through teaching, collecting, curation, and research.

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